

## Factors Associated with Suicidal Ideation in Last-course High School Students Facing the University Entrance Test in Spain

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Received: March 22, 2024; Accepted: April 04, 2024; Published: April 08, 2024

### ABSTRACT

Suicidal ideation has been associated in different studies with emotional disturbances, including anxiety, depressive symptoms and burnout. At the moment, there are not many studies that have explored this association in students who face the university entrance examination in Spain. In this research, our main objective was to explore the association between positive suicidal ideation and anxiety, depressive symptoms and burnout in students who were taking these tests. The study involved 402 last-course high school students who were taking the assessment tests in Granada (Spain), aged between 17 and 24. All of them answered to a survey containing sociodemographic variables, the Spielberger State-Trait Anxiety Inventory (STAI), the Zung's Self-Rating Depression Scale, the one-dimensional scale of Student Burnout and the Positive and Negative Suicidal Ideation Inventory. The results obtained indicate a clear and significant correlation between positive suicidal ideation, anxiety, depressive symptoms and burnout. Of these three variables, the one that best predicts the presence of suicidal ideation is depressive symptoms. Knowing the presence of emotional disturbances and dysfunctional states in these students is important in preventing and intervening in this ideation in students.

**Keywords:** Anxiety, Test Anxiety, Depression, Burnout, University Access

### Introduction

In Spain, as in many other countries worldwide, and despite some debates, a student evaluation system continues to be maintained to enter the university [1,2]. Like any other academic evaluation test, but above all, for its relevant future implications, this type of examination has been associated with emotional disturbances, especially anxiety [3,4]. The entrance exams would thus be considered as a specific situation generating emotional alteration because it implies that the subjects perceive threat, worry, tension and fear during it, which is consistent with the meaning of state-anxiety as considered by the American Psychiatric Association [5]. To this is added, in the case of students, the fear of failure and being negatively evaluated [6]. Their presence is so intense in some countries where they have been studied that over 50% of the students who take the university entrance exams may present very high and almost pathological levels of anxiety [7,8]. This anxiety has been associated with cognitive performance difficulties during exams, as well as other problems, such as low

academic performance or even risk of dropping out of studies [9-12].

The previous preparation and coping with these tests have also been associated with emotional exhaustion and burnout and, in the same vein, other studies have also shown that the presence of anxiety could be associated with higher levels of burnout [8-14].

Burnout has been conceptually delimited as a state of physical and emotional exhaustion characterized by lack of enthusiasm, low productivity, frustration, distancing from the required performance, abandonment and reduction of personal commitment and competence, among other aspects [15,16]. Among the factors that have been related to the emergence and maintenance of burnout in students, it could be the continued exposure to stress and academic overload, which generates deterioration in academic performance and is associated with failure [17-19].

In work contexts, severe and continued burnout has also been associated with mental pathologies and even with suicidal

**Citation:** Antonio Fernández-Castillo, Nuria Roldán-Olmo, Elena Vilchez-Fernández. Factors Associated with Suicidal Ideation in Last-course High School Students Facing the University Entrance Test in Spain. *J Clin Psychol Neurol*. 2024. 2(2): 1-8. DOI: doi.org/10.61440/JCPN.2024.v2.15

ideation and depression [20,21]. Regarding the latter, some studies have found that burnout is also frequent in students who face university entrance exams in other countries [8-22].

The World Health Organisation considers depression as a disease that affects 300 million people world-wide [23]. However, it occurs most frequently as a mood disorder and is a transitory state that is expressed in a set of symptoms that would not be considered as a disease but rather as a depressive state. In that case, its prevalence could be much higher and very difficult to quantify. This symptomatology, both when it is considered an illness and when it is only a more or less transitory depressive state, includes as main manifestations a loss of the ability to enjoy and take interest in daily activities with the presence of a depressed mood. Other somatic and cognitive symptoms are added to this, causing some level of significant distress that is associated with decreased activity, affecting multiple aspects of people's lives [23]. Depression has been associated with sleep and appetite disturbances, low self-esteem and, of course, anxiety [23-25].

Lastly, it should be noted that depression in the student population has also been associated with various emotional disorders and even suicide and suicidal ideation [26]. Regarding the relationship between suicidal ideation and depressive symptomatology, suicidal ideation has traditionally been considered a symptom and predictor of depression [27-28]. However, the reverse relationship has also been studied. After concern about suicide rates and establishing that suicidal ideation frequently occurs before a suicide attempt, many studies have investigated which variables could explain the appearance of this ideation, thus taking depression as an independent variable. Thus, several solid analyses demonstrate the existence and relevance of this reverse research approach on the importance of depressive symptomatology and depression as predictors or causes of suicidal ideation [28-30].

In Spain, according to official data (National Institute of Statistics) suicide is the first external cause of death [31]. According to the latest report (published in December 2022), in 2021 there were 4,003 deaths by suicide in Spain (out of a population of just over 47,400,000 inhabitants). This number is 1.6% higher than in the previous year [31]. To put these data in context, we can take into account that in the same year, 1,599 people (1,283 men and 316 women) died in traffic accidents in this country [31]. Suicide is a major preventable problem in Spain, with a gradual increase in the statistics year after year and with a special increase at younger ages including childhood and especially adolescence [31]. Suicide is the first cause of death in adolescents and young people between 12 and 29 years old in Spain, with a significant increase observed between 2.019 and 2.021. By gender, in Spain suicide is the first cause of external death in men (2,982 deaths) while in women it is the fourth cause with 1,021 deaths [31]. Even so, Spain is not one of the countries that leads suicide statistics in the world according to the WHO, presenting quite similar statistics to those of its surrounding countries [32]. And although according to this organization and other global studies, men show more mortality from suicide than women, women have more suicidal ideation than men, also in adolescence [31,33-36].

Suicidal ideation is considered one of the most important risk factors for death by suicide, presenting twice the risk of dying

from this cause for adolescents and young people who have expressed these thoughts or who have made any previous attempt [37,38]. Although at the moment, there are no precise data on the prevalence of these thoughts, there are data on the incidence of suicides worldwide. According to the World Health Organisation, they could exceed 800,000 cases a year, (some studies indicate that one in 40 people can die from this cause [28,39]). Thus constituting a serious global health problem.

Suicidal ideation has been dually conceptualized, differentiating between positive and negative ideation [40,41]. Negative ideation is associated with direct, negative and real thoughts about suicide and in this regard, a differentiation has been made between active ideation, or thinking focused on ending one's life, and passive ideation, which is more focused on the desire to not want to go on living [42,43]. Concerning positive ideation, it has frequently been conceptualized as indirect, positive and preventive ideas, associated with a greater desire to live [40]. Positive ideation would correlate negatively with negative ideation, being inverse expressions about the same set of thoughts. In fact, low scores on positive suicidal ideation and high scores on negative ideation have been associated with a greater history of suicide attempts [40].

Suicidal ideation, due to its risk associated with attempts and a real risk of death, has attracted the attention of researchers in the educational context. In this area, it has been found to be related to low performance, academic failure and dropping out of school or situations in which students feel subject to high demand, stress and even burnout [44,45]. Some recent studies have shown the presence of suicidal ideation in adolescents even months before university entrance exams [46].

And although suicidal ideation has been associated in different studies with burnout, as we have just seen, as well as with emotional alteration, including anxiety and depression, there are not many studies that have explored this association in students facing the university entrance exam in Spain [26,47]. Hence, we think that it is necessary to study these aspects so that a greater knowledge of these circumstances can help to plan more efficiently initiatives aimed at the prevention of suicide in young people. Therefore, in this work, we propose the following objectives. The first (1) is to explore the positive presence of suicidal ideation in high school students during the assessment tests for university entrance. Secondly, (2) to analyze a possible association between suicidal ideation and anxiety, depression and burnout levels in these subjects. Finally (3), we propose to explore which of the considered variables can predict the presence of positive suicidal ideation in the participants.

According to the consulted bibliography, we propose the following direct hypotheses. Firstly, we hope to find, in accordance with other previous studies, the presence of levels of suicidal ideation in high school students when they face university entrance exams [46]. Secondly, we expect to find, in line with previous evidence that anxiety, depression and burnout are associated with lower levels of positive suicidal ideation [44-46]. Finally, of all the considered variables, we expect, in line with the consulted bibliography that anxiety, depressive symptoms and gender will be the greatest predictors of suicidal ideation in the participating adolescents [28-30,34-36].

In this study, the design used was a retrospective or ex post facto study with a cross-sectional descriptive design to collect data [48].

## Materials and Methods

### Participants

To achieve the stated objectives, 402 final-year high school students participated in this study. All of them were taking the university entrance examination in Granada, Spain, in the June and September calls. The age of the participants is in the range 17-24 years, ( $M = 17.95$ ,  $SD = 1.10$ ). Of them, 247 (61.4%) were female and 147 were male (36.6%), 3 participants (0.8%) did not choose either of the previous dichotomous options, marking instead the “other” box for gender, and 5 (1.2%) of the participants did not report this datum. More descriptive data are detailed in Table 1.

**Table 1: Descriptive analysis**

	Frequencies	N	%
Age (years old) Range: 17-24	17	139	34.6
	18	206	51.2
	19	30	7.5
	20	10	2.5
	21 or more	17	4.2
Gender	Male	147	37.0
	Female	247	62.2
	Other	3	0.8
	Lost	5	

### Instruments

The evaluation instrument began with the request to the participants for information about their age and gender.

To assess the state-anxiety of the participants, we used the Spielberger State-Trait Anxiety Inventory (STAI) in its Spanish version [49]. It is a well-proven reliable and valid instrument, as shown, for example, by the results of the Kuder-Richardson 20 (KR-20) test, where it reached values between .90 and .93. In the case of the State-Anxiety Scale, which was the one used in this study, the split-half test reached a reliability value of  $r = .94$  [49]. The inventory used is made up of 20 items. Each of them is rated on a 4-point response scale (according to the Spanish used version of the instrument), ranging from 0 (not at all) to 3 (very much), resulting in an overall anxiety score for the participant between 0 and 60 [49]. A higher score implies a higher level of anxiety. In our study, Cronbach's Alpha had an excellent value,  $\alpha = .91$ .

To quantify the depressive symptoms in the participants, the Spanish version of Zung's Self-Rating Depression Scale was used [50,51]. This scale is composed of 20 items that are rated on a 4-point scale, ranging from 1 (rarely or never) to 4 (most of the time or always). The total score varies between 20 and 80 if all the items are answered. For the general quantification, the score of half of the items must be reversed because they are reversely expressed. Despite the inconveniences that this could pose, the reversal of the items has been maintained in this study. The original design of the instrument has been respected, thus avoiding that changes in the reverse version could affect the reliability and validity of the instrument.

Regarding the psychometric properties of the original version used, the reliability reached Alpha values between  $\alpha = .79$  and  $\alpha = .92$  [52]. In our study, the reliability was  $\alpha = .83$ .

To assess student burnout, the Spanish population version of the one-dimensional scale of Student Burnout was used [13,53,54]. This scale quantifies students' level of burnout as a one-dimensional variable. The scale is made up of 15 items with four response options, ranging from 1 (never) to 4 (always). The final score obtained by the participant ranged between 15 and 60, with higher scores implying a higher level of exhaustion in educational aspects. The original scale presented excellent internal consistency, verified by the Spearman-Brown split-half test ( $r = .89$ ) or a Cronbach Alpha of  $\alpha = .91$  [54]. In our case, this reliability indicator also reached an excellent value ( $\alpha = .89$ ).

Finally, to obtain an indicator of suicidal ideation, the Spanish adapted version [42,55] of the Positive and Negative Suicidal Ideation Inventory was used [40,41]. The scale presents 14 items of which 8 focus on negative suicidal ideation or risk factors, and 6 focus on positive ideation or protective factors. In this work, only the positive subscale was used, which evaluates factors that protect the individual from the idea of suicide, providing an indirect but reliable indicator [42]. The subscale used is composed of 6 items, the sum of which allows obtaining a total score that indicates reverse suicidal ideation. In this study, the considerations and design of the original version of the instrument were followed, with neither the structure nor the scoring criteria being altered [42,55]. Concerning its reliability, the studies with samples in Spanish presented an Alpha of  $\alpha = .93$  for the Negative Ideation scale and an Alpha of  $\alpha = .84$  for the Positive Ideation scale, or  $\alpha = .89$  for negative and  $\alpha = .77$  for positive ideation, respectively, in other studies [42,55]. In our case, as mentioned, only the Positive Ideation subscale was used, reaching a Cronbach Alpha of  $\alpha = .78$ . This subscale presents five response options ranging from 0 (never) to 4 (always). The possible general scores range between 0 and 24, with 12 being understood as the central score. Below this score, low levels in this variable would begin to be considered. A higher score implies a higher level of positive protective factors, whereas a lower score implies greater negative, direct or real suicidal ideation.

### Procedure

In this research, a quantitative methodology with a descriptive cross-sectional design through a survey was used. The research data were obtained through various visits by the researchers to several sites where the university entrance examination were carried out, in the city of Granada (Spain).

The examinations are popularly known in Spain as “selectivity”. The tests consist of a set of subject exams that vary depending on the specialty that the student has taken in their secondary education (high school) studies. Although it may vary according to regions and academic years, it is usual for the tests to last three days in morning and afternoon sessions. The exams usually take place at the venues of each university and each specific test usually lasts 90 minutes. There is usually a call in June (ordinary call) and another in September (extraordinary call). It usually starts at 9:30 in the morning and ends at 1:30 p.m., with a break of an hour or more between tests. There are also afternoon sessions starting at 4:00 p.m. or 4:30 p.m. depending on the venues.

Once in these locations, students were requested to participate in the research individually by completing the assessment instrument. Students were invited to participate either during breaks between the various assessment exercises or at the exit after any of the sessions. All of them filled out the pencil-and-paper questionnaire on the street in the presence of one of the researchers or previously trained volunteer col-laborators.

The questionnaires were completed on the days of the calls in June and September. All the participants were briefly informed of the general objective of the research and the anonymity of their participation, as at no time were personal data collected that would allow their identification. They were also informed that they would not receive any reward and that they could withdraw from completing the instrument if they so wished at any time. After this information, the participants were invited to sign an informed consent. Parental consent was not requested because according to Spanish law, it is not necessary (Article 13 of Royal Decree 1720/2007 of December 21, 2007; which develops the Organic Law on Protection of Per-sonal Data (LOPD) of December 15, 1999). Lastly, they were asked to answer all the items sincerely, trying not to leave any unanswered.

The data from the questionnaires were downloaded into a database for subsequent statistical analysis. The authors' instructions were followed to calculate the general scores in the different inventories that made up the instrument, taking special care to reverse the scores of the inventories that required it.

Additionally, a favourable report was received from the Research and Ethics Committee of the University of Granada. At all times, the ethical standards considered in the Helsinki declaration were followed. Regulation (EU) 2016/679 of the European Parliament and of the Council of April 27, 2016 on the pro-tection of natural persons with regard to the processing of personal data was followed at all times.

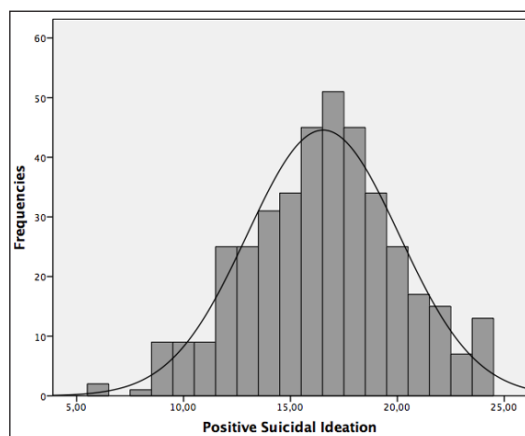
**Data Analysis**

Once the data were obtained, they were analysed with the SPSS statistical software 15.0 version for Windows, assuming for all tests a level of significance of less than .05. Analyses included some of the frequencies and descriptives, Cronbach's Alpha internal consistency tests, Pearson's bivariate correlations (in which anxiety, burnout and depressive symptoms were included to explore their association with suicidal ideation) and a linear regression analysis. In this last analysis, anxiety, depressive symptoms, burnout and gender were considered as independent variables and suicidal ideation as a criterion or de-pendent variable.

**Results**

**First Objective**

For the first of our objectives, we intended to briefly describe the presence of positive suicidal ideation in our participants. The average score on this variable was high (M = 16.529, SD = 3.554). The distribution tended to be above the possible central point (12), with most of our participants scoring higher than this point. This effect can also be observed in Figure 1. We interpret this result as the fact that most of the subjects have medium-high levels of the protective factor of positive ideation.



**Figure 1:** Histogram of frequencies in positive suicidal ideation.

**Second Objective**

As the second objective, we proposed to analyse the association between participants' suicidal ideation and the levels of anxiety, depression and burnout. For this purpose, Pearson's bivariate correlation analyses were carried out, the results of which are detailed in Table 2.

**Table 2: Correlation analysis between positive suicidal ideation and the other variables.**

	Depressive symptoms	Burnout	Positive Suicidal Ideation	Positive Suicidal Ideation
Anxiety	r	.468**	.448**	-.343**
	p	.000	.000	.000
	N	389	392	397
Depressive symptoms	r		.514**	-.454**
	p		.000	.000
	N		389	388
Burnout	r			-.311**
	P			.000
	N			390

The results show a significant negative association between positive suicidal ideation and the target var-iables taken into consideration. Higher levels of anxiety, depressive symptoms and burnout were associ-ated with lower levels of positive preventive ideation about suicide.

**Third Objective**

Finally, concerning the third objective, we proposed to analyse which of the variables considered could predict the presence of suicidal ideation in the participants. For this purpose, a linear regression analysis was carried out in which the anxiety, depression, burnout and gender assessments were introduced as predictors, and suicidal ideation was considered as the criterion or dependent variable. The results ob-tained are presented in Table 3.

**Table 3: Multiple regression analysis: prediction of positive suicidal ideation in students by the target variables.**

Criterion	Predictors	$\beta$	Significance	VIF
Positive Suicidal Ideation	Anxiety	-.152	.006	1.470
	Depression symptoms	-.361	.000	1.560
	Burnout	-.069	.215	1.497
	Gender	.055	.256	1.168
F (4, 383) = 28.036, p < .000.				
R = .478, R <sup>2</sup> = .228, Adjusted R <sup>2</sup> = .220. Error = 3.143				

According to the adjusted R<sup>2</sup>, the model explained 22.8% of the variability of positive suicidal ideation. The results showed that depressive symptoms and anxiety were the best predictors of suicidal ideation in the participating students.

The results of the VIF (Variance Inflation Factor) test on collinearity are low, indicating the non-existence of this problem.

The model showed that burnout and gender were a nonsignificant predictors of positive suicidal ideation. The variables that most predict suicidal ideation are depressive symptomatology and anxiety.

### Discussion

Suicide rates in Spain and especially in the adolescent population is an issue that raises social, authorities and researchers concern nowadays. People who had ended their lives had previously had thoughts about committing suicide and that is why this topic is of great interest to researchers. This research focuses on analysing the presence of suicidal ideation in high school students when taking the university entrance examination in Spain.

Thus, concerning our first objective, the results indicate that most of the participants score above the central point of the distribution in this variable, with the mean score also being high. This fact is positive, considering that positive ideation includes protective thoughts that are opposed to negative ideation or direct suicidal ideation [40]. This result, although positive and hopeful, deserves greater attention from future studies, because a small percentage of subjects with low and very low scores were detected, for whom further study is necessary. Our results confirm the proposed research hypothesis and indicate that there is a presence of suicidal ideation in these subjects, which is in accordance with studies that have found this ideation in similar circumstances even months before the evaluation test [46].

Regarding the second objective, our results found that all three correlations tested were significant and negative. Higher levels of anxiety, depression and burnout are associated with lower levels of positive suicidal ideation. These results agree with those of previous studies associating suicidal ideation with anxiety, and also with investigations of the relationship of suicidal ideation with burnout, and especially with depressive symptoms [20,21,26,47]. The result confirms our working hypotheses.

Finally, our third objective presented highly interesting results. Firstly, because the regression equation indicated that the proposed model has considerable predictive power. Of the

variables introduced in the model, depressive symptoms best predicted less positive suicidal ideation, followed by anxiety. The model reduced the value of burnout when it was introduced together with the other two variables, although, as seen in our second objective, burnout by itself can also be associated with suicidal ideation. In the first place, these results corroborate that the presence of suicidal ideas in these students could be greater than is assumed, and more so considering that there are not many verifiable previous data in Spain. In other countries, there is concern about the precise quantification of suicide attempts in adolescents and young people, as this allows for a better understanding of the national situation and the implementation of pre-vention and intervention initiatives [56].

According to our research, depressive symptomatology is the variable that is the most strongly associated with and predictive of suicidal ideation in these adolescents. We note that there are currently excellent and efficient possibilities for diagnosis and intervention in depression [23,57], especially considering the implications depression may have for suicidal ideation. One of the aspects that should be promoted is the possibility of early detection of students with suicidal ideation. Also in this line, it is also important to implement suicide prevention programs that have been shown to be efficient [58].

We were surprised that gender was also not a predictor of suicidal ideation in our model, contrary to what was expected. Other studies have shown gender differences in suicidal ideation, finding higher levels in women than in men [34-36,46]. A possible explanation of our result may be based on the regression model used, in which, when gender is introduced into the regression model along with depressive symptoms and anxiety, it is these last two variables that assume the greatest part of the predictive weight reducing the others. Additionally, the participants with whom we have worked and their circumstances are peculiar. The participants were subjected to high levels of anxiety and emotional disturbance, which may not give the same results as those obtained in studies more focused on the general population. In any case, these aspects deserve the attention of future studies.

Our study confirms that facing the university entrance test could be associated with burnout, depressive symptoms and anxiety, causing a reduction of positive or protective thoughts and increasing direct or negative suicidal ideation, especially the last two variables. These associations place a small proportion of these students at risk of thinking about ending their own life or at least having ideas about not wanting to go on living. All of this constitutes a topic of high interest for which further study is required, given the suicide data in our country.

As a limitations of our study, there are some variables of high interest that can be studied and that in this case have not been addressed. Thus, future studies may take into account other variables such as the difference between students according to socioeconomic status, the degree to which they want to access, differences between regions in Spain, among other aspects. Another possible limitation of the study is the direction in which the predictive relationship between depressive symptoms and suicidal ideation has been studied. This proposed association, as has been argued and although it is supported by previous

evidence, has normally been studied in the opposite way to that proposed in our study. The way of evaluating suicidal ideation, which is reverse, can also be considered a limitation of the study. Although the measurement and the instrument used have a solid basis of reliability and validity, it could be interesting to replicate our study by measuring direct suicidal ideation with alternative instruments. Each of these limitations does not invalidate or call into question the results obtained, but they can be taken into account as suggestions for future studies.

The university access system in Spain bases the entry to the university on academic and merit criteria. With this, it is tried that economic and social factors affect less the university entrance, as it happens in other countries. However, the Spanish case is far from being a perfect system and as it is based on the grades of the previous academic record and especially on the evaluation entrance exams, it puts students under high academic pressure and emotional disturbance. A possible solution to lower this pressure could be to offer more university places in certain careers in which a very high score is required to access, as well as to promote the offer of educational alternatives in non-university education. Especially since this academic pressure and other variables studied seem to be associated with suicidal ideation in young people in a country where suicide is one of the main causes of unnatural death in the population. In any case, suicide prevention initiatives in adolescents could incorporate the promotion of positive ideas that increase the desire to live, together with the improvement of coping anxiety as well as the reduction of depressive symptoms, fatigue and frustration.

### Conclusions

Our study confirms that facing the university entrance test could be associated with burnout, depressive symptoms and anxiety, causing a reduction of positive or protective thoughts and increasing direct or negative suicidal ideation. These associations place a small proportion of these students at risk of thinking about ending their own life or at least having ideas about not wanting to go on living. All of this constitutes a topic of high interest for which further study is required, given the suicide data in our country.

The current university access model in Spain, based on grades from previous academic courses and on selective evaluation tests, deserves an in-depth reflection, given the intense emotional disturbances it generates in the students who undergo it [59]. A possible solution to reduce the levels of emotional disturbance, depression, burnout and suicidal ideation in this population under these circumstances could be to reduce the weight of university entrance exams. Instead, more importance than they currently have could be given to the qualifications from previous secondary education courses. This could mean that the entrance tests were not considered such high-stakes tests, thus reducing their consequences. This reality, which thousands of students face each year in Spain, is relevant enough to consider the idea of implementing systems of care for these students. We think that this topic is relevant due to the implications that these situations could have for students' physical and psychological health.

**Author Contributions:** Conceptualization: A.F-C., N.R-O.; Methodology: A.F-C., N.R-O., E.V-F.; Data curation/data analysis: A.F-C., N.R-O. and E.V-F.; Writing/original draft

preparation: A.F-C.; Writing/review and editing: A.F-C. All authors have read and agreed to the published version of the manuscript.

**Funding:** This research received no external funding. No competing financial interests exist.

**Ethical Approval** All procedures performed in studies involving human participants were in accordance with the ethical standards of the institutional and national research committee and with the 1964 Helsinki declaration and its later amendments or comparable ethical standards. Regulation (EU) 2016/679 of the European Parliament and of the Council of April 27, 2016 on the protection of natural persons with regard to the processing of personal data was followed at all times.

**Informed Consent Statement:** An informed consent was obtained from all individual participants included in the study.

**Data Availability Statement:** The data and materials are available from the corresponding author upon a reasonable request.

**Conflicts of Interest:** The authors declare no conflict of interest.

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